AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A high efficiency optical feedback modulator operable to produce a high modulation depth optical signal, comprising:

an optical modulator having a first and a second optical input and a first and a second optical output; and

an optical feedback system coupling the second optical output to the second optical input and operable to communicate an optical feedback signal from the second optical output to the second optical input, the optical feedback system including an optical amplifier disposed between the second optical output and the second optical input, the optical amplifier being operable to increase an optical intensity of the optical feedback signal;

wherein the first optical input is operable to receive an input light beam and the optical modulator operates to modulate the input light beam and the optical feedback signal in response to an electrical signal applied around a selected phase angle operating point of the optical modulator within a specified range of phase angles wherein a slope of a transfer curve relating relative optical intensity of an optical signal output by the optical modulator versus phase angle of the optical modulator is at least 0.08725 per degree to output the high modulation depth optical signal from the first optical output.

2. (Canceled)

3. (Original) The high efficiency optical feedback modulator of Claim 1, wherein the optical feedback system comprises an optical waveguide.

4. (Original) The high efficiency optical feedback modulator of Claim 1, wherein the electrical signal comprises an analog signal.

5. (Original) The high efficiency optical feedback modulator of Claim 1, wherein the optical modulator further comprises a first and a second 3dB coupler.

6. (Original) The high efficiency optical feedback modulator of Claim 1, wherein the

optical modulator further comprises a first and a second phase modulator.

7. (Original) The high efficiency optical feedback modulator of Claim 1, wherein the high efficiency optical modulator is disposed within an optical repeater.

8. (Currently Amended) A high efficiency optical feedback modulator comprising:

an optical modulator having at least two optical inputs and at least two optical outputs, an input light beam being receivable on at least one of the optical inputs; and

an optical feedback system configured to feed an optical feedback signal from at least one of the optical outputs to at least one of the optical inputs, the optical feedback system including an optical amplifier disposed between said at least one of the optical outputs and said at least one of the optical inputs, the optical amplifier being operable to increase an optical intensity of the optical feedback signal;

said optical modulator including a first optical coupler wherein the input light beam is combined with the optical feedback signal to produce first and second optical signals;

said optical modulator being operable to modulate the first and second optical signals in response to an electrical signal to produce first and second phase shifted optical signals, the electrical signal being applied around a selected phase angle operating point of the optical modulator within a specified range of phase angles wherein a slope of a transfer curve relating relative optical intensity of an optical signal output by the optical modulator versus phase angle of the optical modulator is at least 0.08725 per degree;

said optical modulator including a second optical coupler wherein the first phase shifted optical signal is combined with the second phased shifted optical signal to produce the optical feedback signal and a high modulation depth optical signal.

9. (Original) The high efficiency optical feedback modulator of Claim 8, wherein the optical modulator comprises a Mach-Zehnder two-by-two optical modulator comprising a first and second optical input, and a first optical output that is the complement of a second optical output, and wherein the feedback system couples the second optical output to the second optical input.

10. (Canceled)

11. (Previously Presented) The high efficiency optical feedback modulator of Claim 8, wherein the optical feedback system comprises first and second optical waveguides coupled by said first and second optical couplers.

12. (Original) The high efficiency optical feedback modulator of Claim 8, wherein the optical modulator comprises a first and a second phase modulator.

13. (Previously Presented) The high efficiency optical feedback modulator of Claim 8, wherein the high efficiency optical feedback modulator is disposed within an optical repeater.

14. (Currently Amended) A fiber optic system comprising:

a high efficiency optical feedback modulator operable to receive an electronic input signal;

an optic fiber coupled to an optical output of the optical modulator and operable to communicate a high modulation depth optical signal; and

an optical receiver operable to receive the high modulation depth optical signal and convert the high modulation depth optical signal into an electronic output signal;

said high efficiency optical feedback modulator including an optical modulator having at least two optical inputs and at least two optical outputs and an optical feedback system feeding an optical feedback signal from at least one of the optical outputs to at least one of the optical inputs, said optical feedback system comprising an optical amplifier disposed between said at least one of the optical outputs and said at least one of the optical inputs, the optical amplifier being operable to increase an optical intensity of the optical feedback signal, said optical modulator being operable to receive an input light beam on at least one of the optical inputs, combine the optical feedback signal with the input light beam, and modulate the combined input light beam and optical feedback signal in response to the electronic input signal applied around a selected phase angle operating point of the optical modulator within a specified range of phase

angles wherein a slope of a transfer curve relating relative optical intensity of an optical signal output by the optical modulator versus phase angle of the optical modulator is at least 0.08725 per degree to produce the high modulation depth optical signal.

15. (Canceled)

16. (Original) The fiber optic system of Claim 14, wherein the optical modulator comprises a Mach Zehnder two-by-two optical modulator.

17. (Original) The fiber optic system of Claim 14, wherein the electronic input signal comprises an analog signal.

18. (Original) The fiber optic system of Claim 14, further comprising an originating system operable to produce the electronic input signal, and a destination system operable to receive the electronic output signal.

19. (Original) The fiber optic system of Claim 18, wherein the originating system comprises a cable television system and the destination system comprises a user distribution system.

20. (Original) The fiber optic system of Claim 18, further comprising at least one high gain optical repeater disposed in-line with the optic fiber.

21. (Currently Amended) A method for producing a high modulation depth optical signal comprising:

communicating an input light beam to a first optical input of an optical modulator;

communicating an optical feedback signal from a second optical output of the optical modulator to a second optical input of the optical modulator, wherein an optical intensity of the optical feedback signal is amplified prior to communicating the optical feedback signal to the second optical input of the optical modulator;

coupling the input light beam with the optical feedback signal to produce a first and a second optical signal;

intensity modulating at least one of the optical signals in response to an electronic input signal applied to the optical modulator to produce a first and a second phase shift optical signal, the electronic input signal being applied around a selected phase angle operating point of the optical modulator within a specified range of phase angles wherein a slope of a transfer curve relating relative optical intensity of an optical signal output by the optical modulator versus phase angle of the optical modulator is at least 0.08725 per degree; and

coupling the phase shift optical signals to produce the high modulation depth optical signal and the optical feedback signal.

22. (Canceled)

23. (Currently Amended) A high efficiency optical feedback modulator comprising:

an optical modulator having at least two optical inputs and at least two optical outputs; and

an optical feedback system coupling at least one of the optical outputs to at least one of the optical inputs, the optical feedback system including an optical amplifier disposed between said at least one of the optical outputs and said at least one of the optical inputs, the optical amplifier being operable to increase an optical intensity of the optical feedback signal;

wherein the optical modulator comprises a Mach-Zehnder two-by-two optical modulator comprising a first and second optical input, and a first optical output that is the complement of a second optical output, and wherein the feedback system couples the second optical output to the second optical input; and

wherein the optical modulator modulates an input light beam received on the first optical input and an optical feedback signal received on the second optical input in response to an electronic input signal applied around a selected phase angle operating point of the optical modulator within a specified range of phase angles wherein a slope of a transfer curve relating relative optical intensity of an optical signal output by the optical modulator versus phase angle of the optical modulator is at least 0.08725 per degree to output a high modulation depth optical

signal.

24-26. (Canceled)

25. (Previously Presented) The high efficiency optical feedback modulator of Claim 1, wherein the specified range of phase angles comprises 250 to 300 degrees.

26. (Previously Presented) The high efficiency optical feedback modulator of Claim 8, wherein the specified range of phase angles comprises 250 to 300 degrees.

27. (Previously Presented) The fiber optic system of Claim 14, wherein the specified range of phase angles comprises 250 to 300 degrees.

28. (Previously Presented) The method for producing a high modulation depth optical signal of Claim 21, wherein the specified range of phase angles comprises 250 to 300 degrees.

30. (Previously Presented) The high efficiency optical feedback modulator of Claim 23, wherein the specified range of phase angles comprises 250 to 300 degrees.